

WHAT IS CLAIMED IS:

1. A system for analyzing a suspension system comprising:

a frame assembly including a plurality of frame units, a base plate, a lower mounting unit, and an upper mounting unit;

a wheel assembly including a wheel member that functions as a wheel, and a wheel mounting assembly for enabling mounting of the wheel member to the upper and lower mounting units of the frame assembly through a suspension;

a steering assembly provided to one side of the frame assembly and being connected to the wheel mounting assembly of the wheel assembly, the steering assembly performing a steering function through a rack-and-pinion operation;

a strut assembly including a shock absorber and a suspension spring and being provided between the wheel assembly and the frame assembly, the strut assembly being able to undergo variations in mounting positions and length between its connection to the wheel mounting assembly of the wheel assembly and the upper mounting unit of the frame assembly; and

an arm assembly including a plurality of arms and links and being provided between the wheel assembly and the frame assembly, the arm assembly being able to undergo variations in mounting positions and length between its connection to the wheel mounting assembly of the wheel assembly and the lower mounting unit of the frame assembly.

2. The system of claim 1 wherein the frame units of the frame assembly comprise:

first and second frame units provided in parallel at a predetermined distance;

a third frame unit interconnecting the first and second frame units; and

fourth frame units provided extending upward from (i.e., substantially perpendicular to) each of the first and second frame units, and

wherein the base plate of the frame assembly is provided on top of the fourth frame units and comprises:

first and second skirts that extend downward from longitudinal edges of the base plate and which are fixed to the fourth frame units;

a pair of receiving slots formed at a predetermined spacing in each of the skirts

and which act as a guide for the lower mounting unit;

an integrally formed section that extends outward from substantially an upper face of the base plate and perpendicular to the second skirt, on which the steering assembly is provided;

5 guide housings mounted on opposite sides of the base plate and extending vertically; and

slide bars slidably provided in the guide housings and able to be fixed at a desired position therein using bolts that pass through bolt holes formed in the guide housings.

10 3. The system of claim 2 wherein the upper mounting unit is provided on upper ends of the slide bars and comprises:

a mounting plate that extends from one slide bar to the other and is fixed to upper ends thereof; and

adjustable mounts, each of which is fixed to an opposite end of the mounting plate, one end of each of the adjustable mounts including one connecting slot and a pair of slide slots for enabling fixing and position adjustment on the mounting plate, and connecting slots being formed on opposite ends of the adjustable mounts to which the strut assembly is connected.

15 4. The system of claim 2 wherein the lower mounting unit is realized through an arm connecting plate that passes through one of the receiving slots in the skirt and a corresponding receiving slot in the opposing skirt, the first arm connecting plate including connecting slots that are formed at a predetermined length along a longitudinal direction of the arm connecting plate and on both ends thereof, and the arm connecting plate including a threaded bolt hole at a center position thereof, a bolt being
20 screwed into the bolt hole until making close contact with the base plate to fix a position of the arm connecting plate.

5. The system of claim 1 wherein the wheel member of the wheel assembly is a circular plate made of a transparent plastic material.

25 6. The system of claim 1 wherein the wheel mounting assembly of the wheel assembly comprises:

a connecting bracket, which is coupled to the wheel member through a plurality

of bolts at a position slightly below a center of the wheel member;

a knuckle bracket, which is connected to the wheel member through a plurality of bolts at a position slightly above the center of the wheel member, a lower end of the strut assembly being connected to the knuckle bracket; and

5 a knuckle plate fixed to a rear portion of the knuckle bracket and having a slot for connection with the steering assembly.

7. The system of claim 1 wherein the steering assembly is mounted on the base plate and comprises:

10 a rack bar that extends in a longitudinal direction of the base plate, and which undergoes rectilinear motion while being guided by a guide, the rack bar including a rack segment that is formed at a center thereof and at a predetermined length, and adjustable segments formed on both ends of the rack bar;

a pinion meshed with the rack segment of the rack bar;

15 a rotating bar passed through a center of the pinion, one end of the rotating bar being rotatably connected to a support bracket, which is fixed to the base plate, and a control knob being formed on its other end; and

20 a knuckle arm connected via a universal joint to each extreme end of the rack bar, ball joints being provided at the ends of the knuckle arms, the ball joint corresponding to the side of the system being used, and being connected to the wheel mounting assembly of the wheel assembly.

8. The system of claim 7 wherein the adjustable segments of the rack bar comprise:

a hollow tube that has a groove of a large width formed along a predetermined length of the hollow tube; and

25 a rod, a majority of which is slidably provided within the hollow tube, a threaded bolt hole being formed in the rod, and a fixing bolt being screwed into the bolt hole via the groove of the hollow tube.

9. The system of claim 1 wherein the shock absorber of the strut assembly comprises:

30 a housing, which is a hollow tube and includes a lower spring seat integrally formed on an upper end thereof;

a piston rod passed through the lower spring seat into the housing; and
an upper spring seat integrally formed to an upper end of the piston rod, and
wherein the suspension spring of the strut assembly is interposed between the
lower spring seat and the upper spring seat, and is made of a plastic material.

10. The system of claim 1 wherein the arm assembly comprises:

an A-shaped arm link, which includes a plurality of slots and is connected to
the wheel mounting assembly of the wheel assembly through a ball joint; and

a plurality of adjustable arms connected to the slots of the A-shaped link
through ball joints, opposite ends of the adjustable arms being connected to the lower
mounting unit of the wheel assembly through ball joints, the adjustable arms able to
undergo variations in length.

11. The system of claim 10 wherein each of the adjustable arms comprises:

a hollow tube;

threaded inserts of a predetermined length fixed within opposite ends of each of
the adjustable arms; and

bolts screwed into the threaded inserts, the ball joints connected to the A-
shaped link being integrally formed to distal ends of the bolts, the threading of the bolts
in relation to the inserts being such to allow the length of the adjustable arms to be
varied by manually rotating the hollow tube portion of the adjustable arms.